



Fig 6 Jejunum pressure recordings three days after right hemicolectomy, showing effect of Prostigmin and atropine injected intravenously during a phase of activity. Pressures up to 40 mmHg recorded before, and up to 45 mmHg recorded after the injection

minute. (These side-effects were later neutralized by further doses of atropine.) Injected at a time when no contractions were being recorded, these drugs produced no effect, but during activity there was a small and insignificant increase in the magnitude of the intestinal pressures (Fig 6).

Discussion

The intestinal pressure tracings made during a normal convalescence from various abdominal operations (including gastric resection and vagotomy) reveal powerful activity. It seems reasonable to interpret most of this activity as being due to segmentation. Less frequent, weaker, but longer contraction waves have been seen and may represent propulsion activity. The pressures recorded were higher than we had anticipated, and were considerably greater than those so far obtained through telemetry capsules: we believe that the ease with which a capsule can escape from a segment of bowel at high pressure may explain these differences.

These studies clearly show that intestinal contractions continue after major abdominal surgery. They do not, however, tell us whether the tracings indicate normal digestion and propulsion: the X-ray studies appear to support this, but, although we were successful in the early feeding of some of our patients, this was not the case in

all of them. Nevertheless, the similarity between recordings obtained shortly after operation and those made later in convalescence, when the patient was eating and drinking, should encourage us to abandon the concept of an obligatory period of ileus after operation – a concept certainly not shared by an earlier generation of surgeons (Moynihan 1926), who allowed their patients to drink from the day of operation.

Summary: Intestinal activity in the early post-operative phase has been studied by two methods. It continues throughout this period. The significance of intestinal pressures and the wave patterns produced are discussed. X-ray evidence suggests a form of early propulsion.

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The Varicose Tributaries of the Popliteal Vein

by Harold Dodd chm (London)

Since 1956 three sets of varicose tributaries of the popliteal vein have become established: the short saphenous vein, the gastrocnemial veins, and those draining the skin and fat of the popliteal space.

A varicose short saphenous vein has been found on several occasions when it had not been diagnosed clinically, and as a result of a sharper look-out it has been found to be incompetent in the proportion of 1 in 7 to the long saphenous, as against 1 in 10 as was previously thought. In 1926 Kosinski showed that the short saphena ended chiefly in the popliteal space, but occasionally in the lower thigh or calf. In 400 operations done on this vein since 1955, we have found that it joined the popliteal vein in 77%, the veins of the thigh in 18% and the calf veins in 5%.

Diagnosis is by means of two tourniquets, one at the knee, and the other at the lower third of the thigh. The patient stands for 20 seconds. If the veins remain flaccid, the ankle-perforating veins are competent but, if they fill, these vessels are probably incompetent. The knee tourniquet is released. If the vessels obviously distend or become tenser, there is a leak from the popliteal space, commonly from the external saphenous vein. The tourniquet at the level of the lower end of Hunter's canal prevents filling from defective tributaries entering the superficial femoral vein

and a varicose long saphenous vein. Concomitant leaks from the long saphenous vein, Hunter's canal veins, and ankle-perforating veins are fairly frequent. These with popliteal vein tributaries give 15 presentations per limb, and the two legs of the same person are often different.

Gastrocnemial veins: These were recognized as a varicose entity in 1956. Two fair-sized veins emerge from the medial aspect of each head of gastrocnemius and join the popliteal vein (71%), although variations, such as union with each other, with the short saphenous and with a popliteal-area vein, are common. Veins from one or both heads may be defective, sometimes with an associated sizeable varix. The medial vein was varicose in 63% of 400 popliteal space operations, the lateral in 33%, and both in 15%. A varicose gastrocnemial vein was found in over 70% of operations in this area since 1956. Reversed flow, as described below, was present in 93% of veins considered to be faulty.

Gastrocnemial veins are diagnosed when enlarged veins are palpable on one or both sides of the centre of the popliteal space at knee-joint level. Slight flexion of the joint facilitates this. The small saphena is often defective also. At operation, the defective gastrocnemial veins may bulge from between the gastrocnemial heads, and a varix may be present.

In the 400 operations the short saphena was normal in 20%, but there was a fault in the gastrocnemial and/or popliteal-area veins.

Popliteal-area veins: These have been noted since 1956. Their pattern as varicose tributaries of the popliteal vein to be diagnosed clinically and looked for at operation became apparent in December 1961, when 185 cases had been seen. Since then 80 more have been noted. Popliteal-area veins drain the skin and fat over the popliteal space, lower thigh and upper calf. They enter the popliteal space through one of four corners or its centre. Those through the lateral angle (35%) and centre (35%) are the commonest. About half the popliteal-area veins join the short saphena. Most of the rest (40%) pass to the popliteal vein direct. A few (10%) join the gastrocnemial veins. When incompetent they are tortuous and often the seat of a considerable varix. The bleed-back test has always been positive. They frequently end in the side of the popliteal vein close to the adductor foramen. Unless they are diagnosed they can be missed, especially the lateral which quickly passes under the lateral popliteal nerve to finish high in the space. Once recognized, the diagnosis and treatment of these veins are straightforward.

The four veins, the small saphena, two gastrocnemial, and a popliteal-area vein can give seven possible combinations in this region.

The Operation for the Varicose Tributaries of the Popliteal Vein

The incision, bow or boomerang, runs from the upper to the lower end of the popliteal space, curving inwards to pass through the dimple behind the knee-joint where the inner longitudinal groove intersects the transverse skin crease. The skin, fat and deep fascia are reflected outwards until the lateral popliteal nerve can be seen at the external angle of the popliteal space. The five points of entry of the popliteal-area veins are now uncovered. If any are varicose, they are divided at their final endings.

The short saphenous vein is traced to its termination, the constant post-axial vein being divided. The medial popliteal nerve is retracted by a soft rubber catheter. The saphenopopliteal junction becomes deeper as it ascends the popliteal space. A varix is frequent, and a considerable gastrocnemial vein may join here, and also several small veins, injury to which quickly converts the wound into a blood-bath. The saphenopopliteal junction is secured twice. The reversed flow test is almost invariably positive. The short saphenous trunk has not been stripped for a year, but nevertheless the results are satisfactory.

The gastrocnemial veins: The space between the heads of gastrocnemius is opened at knee-joint level. The popliteal vein is most superficial here, lying under the medial popliteal nerve. The nerve is held aside, first laterally, and then medially, to expose the medial aspect of either gastrocnemial head out of which two sizeable veins emerge, one or both of which may be incompetent. If doubt exists, then the vein is tested before it is divided as described below. Only incompetent veins should be divided.

The wound: Incisions in the popliteal space give more concern in healing than elsewhere. Careful closure and a sustained pressure dressing for two weeks eliminate anxiety. The firm dressing is continued until healing is sound. Early discontinuation of protection may be followed by keloid thickening and a small intractable ulcer. Both respond to the secure pad and bandage, changed infrequently and sustained until epithelization is stable.

The Popliteal Vein

The extended exploration of the popliteal space has revealed the popliteal vein. In 10 of 270 cases it was varicose, being very large and the seat of varicose dilatations. In 20 it was represented by persistence of the posterior tibial venae comites up to the upper part of the popliteal space. The tributaries then joined one or other division. Reversed flow was present from the faulty veins as from those joining the popliteal vein.

In two patients, where the long and short saphenous veins and ankle-perforating veins were already ligated and a leak was still present from the popliteal space, the popliteal vein was proved after testing to be incompetent and was divided. Both patients have an unusually good result. Thus Bauer's ligation of the main deep vein appears to have a useful place in an established incompetent popliteal vein with swelling, eczema, and ulceration.

Tests at Operation for Venous Incompetence

Four tests are available. Three do no harm to the vein, but the last requires ligation in any case. The tenet followed is that a surgeon may divide only those veins proved by testing to be defective either pre-operatively or at operation.

- (1) A ligature of softened catgut is passed twice round the vein at its union with the parent. It is watched distally. If normal, it will dilate and become tense in two to three minutes. If faulty, it shrinks and remains soft, for it is no longer filled by the reversed flow permitted by the failed terminal valve from the parent vein.
- (2) Saline is quickly injected retrogradely into the suspect vein. When normal, the valves prevent the reversed flow, so the vessel dilates and saline squirts out beside the needle puncture. A faulty vessel will accept unlimited quantities quickly without distension or a leak.
- (3) The ligature is moved 2–2.5 cm distal to the union with the parent vein. The suspect vessel is squeezed to its end. If healthy, it will remain flattened and white like a piece of tape because the end valve allows no reflux. When varicose, the emptied vein immediately fills with the back flow.
- (4) If the vessel is snicked across immediately above the ligature, nothing will emerge from a good vein, but an outflow of blood, possibly with a spurt, issues from it when deficient.

These tests were made on many consecutive popliteal space veins with consistent condemning evidence. Not infrequently, apparently normal vessels proved to be defective although the patient was anaesthetized and in a tilted head-down position which would favour slightly faulty valves becoming temporarily efficient. Again, the dissection causes the vein to contract which further militates against a bleed-back.

Conclusion

Varicose veins deriving from the popliteal space are those most likely to be missed. Their dissection is rewarding. [A film depicting the operation was shown.]

REFERENCE

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Antral Dysfunction after Vagotomy and Simple Drainage

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It is now well recognized that both incomplete nerve section and antral retention are causes of recurrent ulceration after vagotomy and simple drainage for duodenal ulceration. In the first, recurrence appears to be due to a persistent cephalic phase of gastric acid secretion, and in the second to an augmented hormonal phase. This paper is concerned with antral dysfunction after vagotomy and gastrojejunostomy or vagotomy and pyloroplasty.

Dysfunction after Vagotomy and Gastrojejunostomy

If a gastrojejunostomy is made proximal to a normal pyloric ring and to an unobstructed duodenum, the prepyloric stomach distal to the short-circuit stoma can empty itself satisfactorily through the duodenum, and probably in these circumstances recurrent ulceration from antral dysfunction seldom if ever occurs. If, however, there is either pyloric canal stenosis or duodenal stenosis, then stasis may occur in the prepyloric stomach. Experience shows that in these circumstances gastrojejunal ulceration may occur, presumably from a hormonal phase of gastric secretion augmented by the retention. In one such patient there was a large gastrojejunal ulcer associated with antral retention in the ten-hour film. This large gastrojejunal ulcer healed without treatment and has remained so for years.

There is another form of antral dysfunction following vagotomy and gastrojejunostomy when the stoma is made proximal to a stenosed pyloric ring or duodenum. It is well shown in the following case:

Case 1

L T, male, aged 56

Vagotomy and gastrojejunostomy were performed for duodenal ulceration in 1959. At that time we were not familiar with peptic pyloric ring stenosis. The patient remained well for four years and then developed anorexia and loss of weight with a hæmoglobin of 55% and positive occult blood tests in the stools. A provisional clinical diagnosis of gastric neoplasm was made. X-ray examination revealed persistent deformity of that part of the stomach between the pylorus and the gastrojejunostomy stoma (Fig 1). At first it was thought that this deformity was in the nature of a malignant filling defect, but with more careful observation it was noted that the thin barium track in this area was smooth. The appearances were rather those of spasm than of neoplasm.